REMARKS

Claims 1 and 3-22 are pending in this application. Claims 1 and 7 are the independent claims. Claim 2 was previously cancelled. Reconsideration and allowance of the present application

Example Embodiments

As described in at least paragraph [0006] of Applicant's published application (U.S. published application number 2006/0099557 A1), example embodiments provide for different "virtual environments" 4 (see at least FIG. 3 of the instant disclosure) that may be created without modeling the entire environment from the beginning. This is accomplished via a type of _building block_ functionality, as provided by the recited inventions of independent claims 1 and 7. Specifically, as described in at least paragraphs [0006] through [0009] of the published application, a "main virtual anatomic environment" 1 (included in the main virtual anatomic environment modeler 15, as shown in FIG. 3 of the instant disclosure) is provided, which may represent an internal cavity of a living being (e.g., the "main virtual anatomic environment" 1 may represent an abdominal cavity or a chest cavity). As described in at least paragraphs [0007] and [0008] of the published application, a "library" 3 of "local anatomic environments" 2 is also provided, where each "local anatomic environment" 2 may represent an organ which includes corresponding arteries, veins, and ducts. Specifically, each "local anatomic environment" 2 may represent a _different configuration_ of an organ with its corresponding arteries, veins, and ducts, as they would be found in a living being (i.e., many "local anatomic environments" 2 may be created for each one organ found in a living being, each "local anatomic environment"

2 showing a different position and/or shape of the organ, or a different configuration of arteries, veins and ducts that may be entering/exiting the organ). As recited in claims 1 and 7, various "virtual environments" 4 (a *complete model* of an area of a living being) may then be created by including various "local anatomic environments" 2 in a "main virtual anatomic environment" 1. In this sense, the "virtual environment" 4 is the *finished product*, whereas the "main virtual anatomic environment" 1 and the "local anatomic environments" 2 are *building blocks* that may be combined to produce the *finished product* (the completed model).

It is important to note that recited claims 1 and 7 provide the benefit of needing to model each variation of a "local anatomic environment" 2 **only once**, and thereafter the *building block* functionality of claims 1 and 7 allow for a great number of "virtual environments" 4 to then be created by swapping out different "local environments" 2 within a "main virtual anatomic environment" 1 (as opposed to separately modeling an entire "virtual anatomic environment" 4, including many combinations of separately configured "local anatomic environments" 2, from the beginning).

As described in at least paragraph [0008] of the published application, and as claimed in dependent claims 3 and 9, the "local anatomic environments" 2 (i.e., the *building blocks* of the completed model) may be randomly selected, such that the probability of randomly selecting a certain "local anatomic environment" 2 may correspond with the degree of occurrence that the "local anatomic environment" 2 is found in living beings, in order to provide a realistic simulation of a "virtual environment" 4 (i.e., the *completed model*).

Rejections under 35 U.S.C. §103 – *Jacobus in view of Rice*

Claims 1, 5, 7, 8, 11, 12, and 14-22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,769,640 ("Jacobus") in view of U.S. Patent 6,310,619 ("Rice"). This rejection is respectfully traversed.

With regard to independent claim 1, the Examiner asserts that Jacobus discloses all of the claim limitations with the exception that Jacobus does not disclose the feature of the selection of different combinations of selected local anatomic environments in said main virtual anatomic environment thereby allowing generation of different virtual environments, each different virtual environment representing anatomic variations occurring in living beings including selected local anatomic environments in said main virtual anatomic environment to form said virtual anatomic environment. The Examiner asserts that Rice discloses these missing limitations. The Examiner asserts that it would have been obvious to a person of ordinary skill in the art to modify Jacobus by incorporating the teachings of Rice in order to provide a computer-implemented virtual reality, tissue-specific body model that increases the efficiency and accuracy of anatomical study in an environment having user-variable physical and environmental properties as taught by Rice. Applicant asserts that Jacobus in view of Rice does not teach or suggest "selecting a local anatomic environment from a predefined library comprising a set of two or more local anatomic environments, all of the local anatomic environments of the library being *separately modelled three-dimensional models each representing an individual anatomic variation in a local internal area of a living being,*" as recited in claim 1. Applicant further asserts that neither Jacobus, nor Rice, teach or suggest the *building block* functionality of a "main virtual anatomic environment," a library of "local anatomic

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environments," and a "virtual anatomic environment" that combine to provide "*the selection of different combinations of selected local anatomic environments in said main virtual anatomic environment thereby allowing generation of different virtual environments*," as recited claim 1.

Applicant submits that Jacobus teaches a method of measuring and recording sights and sounds of a medical procedure, for accurate play back of the recording to generate new information to emulate responses to alternative actions taken by a surgeon trainee during simulation. The Jacobus method appears to be best summarized in column 4, lines 30-38, which cites two basic functions of the method. Specifically, the first function of Jacobus is "*measuring and recording,*" and the second function is "*accurately playing back* . . . *using the recorded data.*" Applicant submits that the purpose of Jacobus is to fully *record* (as opposed to "*simulate*") medical procedures, one procedure at a time, in order to compile images for later playback. Images not fully recorded during the medical procedure itself, may be supplemented with images taken from other "medical diagnostics or image modalities," described in column 4, lines 5-9 of Jacobus to include CT data, PET data, MRI data, etc. Applicant asserts that the *measuring, recording,* and *accurate playback of recorded data images* (both images that are taken during the recording of the initial procedure, as well as images taken during "medical diagnostics"), is not providing a library of "local anatomic environments," all of the local anatomic environments being "*separately modelled three-dimensional models,*" as recited in claim 1. Specifically, Applicant asserts that Jacobus is not "*modeling*" the "local anatomic environments," as recited in claim 1, but rather Jacobus is only *measuring* and *recording* images. And for at least

this reason, Applicant asserts that Jacobus does not teach all of the limitations of claim 1.

Furthermore, Applicant asserts that Jacobus does not teach "all of the local anatomic environments of the library being separately modelled three-dimensional models *each representing an individual anatomic variation in a local internal area of a living being*," as recited in claim 1. The purpose of Jacobus is to *measure* and *record* images for accurate *playback*, and any images that Jacobus does not collect through the initial recording of the medical procedure, are then supplemented by diagnostic images. Jacobus does not teach, anywhere in the reference, that *each* of the "local anatomic environments" systematically represents a different "anatomic variation" occurring in a living being. At best, Jacobus allows for the *measurement/recording* of images during a medical procedure, or during medical diagnostics, which may capture some miscellaneous "*anatomic variations*," by luck or chance. However, Jacobus does not purposefully produce a library comprised of separately modeled "local anatomic environments," where *each* environment represents an anatomic variation in a living being. For at least these reasons, Applicant asserts that Jacobus does not teach "all of the local anatomic environments of the library being separately modelled three-dimensional models *each representing an individual anatomic variation in a local internal area of a living being*," as recited in claim 1.

Furthermore, Applicant submits that because Jacobus only discloses the separate modeling of an *entire virtual environment* (through the measuring, recording, and playback) of a medical procedure, rather than the modeling of separate local anatomic environments "*each representing an individual anatomic variation in a local internal area of a living being*," as recited in claim 1, Applicant therefore asserts that

Jacobus does not teach or suggest the _building block_ functionality of selecting "local anatomic environments" to be placed in a "main virtual anatomic environment" to create a "virtual anatomic environment." For this reason, Applicant asserts that Jacobus does not teach or suggest, or even contemplate "_the selection of different combinations of selected local anatomic environments in said main virtual anatomic environment thereby allowing generation of different virtual environments_," as recited in claim 1.

Applicant asserts that a review of Rice indicates that Rice does not remedy the deficiencies of Jacobus, as described above. Rice discloses a complete three-dimensional, virtual reality, tissue-specific model of a living being, as described in column 4, line 54 to column 5, line 30. As described in column 5, lines 16-25, the model may include a database of cross-section images taken from CT, MRI images, and cryosection images to develop a database of images used to create the _tissue-specific models_. Column 5, lines 3-8 provides an example list of five "_tissue-specific models_," the models including 1) compact and calcious bone, 2) skeletal and smooth muscle, 3) hyaline, fibrous, elastic and articular cartilage, 4) dense regular and irregular connective tissue (tendons, ligaments, and facia), and 5) central and peripheral nervous tissue. As described in column 5, lines 8-12, each of these _tissue-specific models_ is presented in an anatomically correct orientation, as they relate to the other _tissue-specific models_. As described in column 5, lines 10-12, an example an anatomically correct orientation includes, for instance the biceps brachii (the _tissue-specific model_ of "skeletal and smooth muscle") with its proper anatomical connection to the humorous, ulna, and radius (the _tissue-specific model_ of "compact and calcious bone"), as shown in FIG. 1 of Rice. In other words, Applicant submits that Rice

discloses the use CT, MRI images, and cryosection images to create **_one overall_**

model that includes **_one tissue-specific model_** for each type of tissue, allowing a user

to display desired tissue-specific models to highlight bone, muscle, cartilage,

connective tissue, and/or nervous tissue. Applicant asserts that the **_one overall_**

model (comprised of one tissue-specific model, for each tissue type), as taught by

Rice, therefore does not teach or suggest a library of local anatomic environments,

where the local anatomic environments are "*separately modelled three-dimensional*

models each representing an individual anatomic variation in a local internal area of a

living being," as recited claim 1. Rather, Rice only discloses building **_one model_**, from

a miscellaneous compilation of images, thereby providing no "anatomic variation" at

all, outside of offering one male model and one female model (as described in column

5, lines 13-30).

Applicant further asserts that because Rice only discloses building **_one model_**,

Rice therefore does not teach or suggest the *building block* functionality of a "main

virtual anatomic environment," a library of "local anatomic environments," and a

"virtual anatomic environment." At best, Rice only discloses the *building blocks* of

tissue-specific models (for instance, the *tissue-specific model* of bone, muscle, cartilage,

connective tissue, and/or nervous tissue), where each *one tissue-specific model*

combines to form a single overall model of a male or female human. However, Rice

does not teach or suggest, or even contemplate "*the selection of different combinations*

of selected local anatomic environments in said main virtual anatomic environment

thereby allowing generation of different virtual environments," as recited in claim 1.

With regard to dependent claim 21, Applicant asserts that Jacobus in view of

Rice does not teach or suggest "*wherein components included in the local anatomic*

environment are excluded in the main virtual anatomic environment," as recited in claim 21. Specifically, Applicant submits that column 4, lines 1-38 of Jacobus does not teach or suggest a "*local anatomic environment*" that is separate from a "*main virtual anatomic environment*," as recited in claim 21. Applicant submits that Jacobus does not pertain to the efficient *building block* functionality of a predefined library of "local anatomic environments" where different "local anatomic environments" can be selected as subcomponents of a "main virtual anatomic environment." For this reason, Jacobus does not teach or suggest, or even contemplate providing a "*local anatomic environment*" that is separate from a "*main virtual anatomic environment*," as recited in claim 21. Applicant asserts that a review of Rice indicates that Rice does not remedy the deficiencies of Jacobus. Rice only discloses building **one overall model** from a compilation of images, but Rice does not teach or suggest a "*local anatomic environment*" separate from a "*main virtual anatomic environment.*" For at least these reasons, Applicant asserts that neither Jacobus, nor Rice, either singly or in combination with each other, teach or suggest "*wherein components included in the local anatomic environment are excluded in the main virtual anatomic environment*," as recited in claim 21.

With regard to independent claim 7 and dependent claim 22, Applicant asserts that these claims contain features similar to independent claim 1 and dependent claim 21, respectively.

For at least the reasons stated above related to independent claims 1 and 7, and dependent claim 21 and 22, Applicant asserts that these claims are patentable. Due at least to the dependence of claims 5, 8, 11-12, and 14-20 on the independent claims, Applicant also asserts that these claims are patentable. Therefore, Applicant

respectfully requests that this art ground of rejection of these claims under 35 U.S.C.
§103 be withdrawn.

Rejections under 35 U.S.C. §103 – *Jacobus in view of Rice and further in view of Ramshaw*

Claims 3, 4, 6, 9, 10, and 13 stand rejected under 35 U.S.C. §103(a) as being
unpatentable over Jacobus in view of Rice and further in view of U.S. Patent
5,791,907 ("Ramshaw"). This rejection is respectfully traversed.

With regard to dependent claim 3, the Examiner concedes that Jacobus in view
of Rice fails to teach the step of randomly selecting one of the local anatomic
environments in the library.[1] The Examiner asserts that Ramshaw teaches this
limitation, as the Examiner cites column 17, lines 9-12 of Ramshaw in making this
assertion. Applicant submits that Ramshaw is an interactive medical training system
used to provide education and training in medical procedures. Column 17, lines 9-12
indicates that Ramshaw allows for the simulation of *random and unexpected errors
during a medical procedure*. Column 17, lines 13-16 provides an example of an "*error*,"
as in the case where a user may properly select the use of a balloon dissector in a
medical procedure where the medical procedure equipment may nevertheless illustrate
improper balloon placement. Ramshaw's use of randomly simulated *unexpected errors*
does not teach or suggest randomly selecting between "*local anatomic environments*,"
as recited in claim 1. And therefore the Examiner's assertion that Ramshaw *randomly
selects* between "local anatomic environments" is entirely without merit. Applicant
therefore asserts that neither Jacobus, nor Rice, nor Ramshaw, either singly or in

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[1] Page 6 of the current Office Action.

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combination with each other, teach or suggest "wherein the step of selecting a local anatomic environment from a predefined library comprising two or more of local anatomic environments further comprises the step of _randomly selecting one of the local anatomic environments in the library_," as recited in claim 3.

With regard to dependent claim 4, Applciant asserts that Jacobus in view of Rice and further in view of Ramshaw, does not teach or suggest "_wherein the probability of randomly selecting a certain local anatomic environment essentially corresponds with the degree of occurrence of that local anatomic environment in living beings_," as recited in claim 4. Applicant submits that column 17, lines 25-31 of Ramshaw only disclose simulating random **errors** occurring in a medical procedure, rather than providing randomly selected "_local anatomic environments_" that correspond with the degree of occurrence that the "_local anatomic environment_" would have in a living beings. Applicant asserts that Jacobus in view of Rice does not remedy this deficiency of Ramshaw. Applicant asserts that because Jacobus in view of Rice does not disclose randomly selecting between "local anatomic environments," as recited in base claim 3, Applicant therefore also asserts that Jacobus in view of Rice also does not disclose the random selection of a "local anatomic environment" that corresponds to the degree of occurrence the "local anatomic environment" has in a living being. For at least this reason, Applicant asserts that neither Jacobus, nor Rice, nor Ramshaw, either singly or in combination with each other, teach or suggest "_wherein the probability of randomly selecting a certain local anatomic environment essentially corresponds with the degree of occurrence of that local anatomic environment in living beings_," as recited in claim 4.

With regard to dependent claims 9 and 10, Applicant asserts that these claims contain features similar to claims 3 and 4, respectively, such that at least the same arguments can be made.

For at least the reasons stated above related to dependent claims 3, 4, 9, and 10, Applicant asserts that these claims are patentable. Due at least to the dependence of claims 6 and 13 on the independent claims, Applicant also asserts that these claims are patentable. Therefore, Applicant respectfully requests that this art ground of rejection of these claims under 35 U.S.C. §103 be withdrawn.

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CONCLUSION

In view of the above remarks, Applicant respectfully submits that each of the rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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